[4910-13-P]

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 39

[Docket No. FAA-2015-0165; Directorate Identifier 2015-NE-02-AD; Amendment 39-18868; AD 2017-09-06]

RIN 2120-AA64

Airworthiness Directives; General Electric Company Turbofan Engines

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Final rule.

SUMMARY: We are superseding Airworthiness Directive (AD) 2015-15-03 for all General Electric Company (GE) GEnx turbofan engine models. AD 2015-15-03 precluded the use of certain electronic engine control (EEC) full authority digital engine control (FADEC) software on GEnx turbofan engines. This AD requires removing a specific part and replacing it with a part eligible for installation and specifying the EEC FADEC software version for the affected GEnx turbofan engines. This AD was prompted by GE implementing final design changes that remove the unsafe condition. We are issuing this AD to correct the unsafe condition on these products.

DATES: This AD is effective [INSERT DATE 35 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

ADDRESSES: For service information identified in this final rule, contact General Electric Company, GE Aviation, Room 285, 1 Neumann Way, Cincinnati, OH 45215; phone: 513-552-3272; email: geae.aoc@ge.com. You may view this service information at the FAA, Engine & Propeller Directorate, 1200 District Avenue, Burlington, MA. For information on the availability of this material at the FAA, call 781-238-7125.

Examining the AD Docket

You may examine the AD docket on the Internet at http://www.regulations.gov by searching for and locating Docket No. FAA-2015-0165; or in person at the Docket Management Facility between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays. The AD docket contains this AD, the regulatory evaluation, any comments received, and other information. The address for the Docket Office (phone: 800-647-5527) is Document Management Facility, U.S. Department of Transportation, Docket Operations, M-30, West Building Ground Floor, Room W12-140, 1200 New Jersey Avenue SE., Washington, DC 20590.

FOR FURTHER INFORMATION CONTACT: Christopher McGuire, Aerospace Engineer, Engine Certification Office, FAA, Engine & Propeller Directorate, 1200 District Avenue, Burlington, MA 01803; phone: 781-238-7120; fax: 781-238-7199; email: chris.mcguire@faa.gov.

SUPPLEMENTARY INFORMATION:

Discussion

We issued a notice of proposed rulemaking (NPRM) to amend 14 CFR part 39 to supersede AD 2015-15-03, Amendment 39-18212 (80 FR 42707, July 20, 2015), ("AD 2015-15-03"). AD 2015-15-03 applied to all GE GEnx turbofan engine models. The NPRM published in the Federal Register on November 3, 2016 (81 FR 76540). The NPRM was prompted by GE implementing final design changes that remove the unsafe condition. The NPRM proposed to remove a specific part and replace it with a part eligible for installation and specify the EEC FADEC software version for the affected GEnx turbofan engines. We are issuing this AD to prevent engine failure, loss of thrust control, and damage to the airplane.

Comments

We gave the public the opportunity to participate in developing this AD. The following presents the comments received on the NPRM and the FAA's response to each comment.

Request to Change Compliance

The Boeing Company and GE requested that we amend paragraph (f) to clarify which software versions are prohibited from being installed. They stated that the listed software versions do not contain the highest level of ice crystal icing (ICI) accommodation.

We agree. We revised this AD because the listed software versions do not contain the highest level of ICI accommodation features. Also, the change requested makes the prohibition statement consistent with the AD removal requirements.

Request to Add Terminating Action

The Boeing Company requested that we add compliance to this AD as a terminating action to AD 2013-24-01, Amendment 39-17675 (78 FR 70851, November 27, 2013), ("AD 2013-24-01") since it removes the unsafe condition.

We partially agree. We agree that complying with this AD is terminating action for certain requirements of AD 2013-24-01. Therefore, we added a new terminating action paragraph (h) of this AD. Since complying with this AD is terminating action to certain requirements of AD 2013-24-01, we disagree that complying with this AD is terminating action for all requirements of AD 2013-24-01.

Request to Add Terminating Action

The Boeing Company requests that 747-8 and 747-8F aircraft with GEnx-2B engines that are operating with software, version C075, be granted a relaxation of the requirements in paragraphs (g) and (h) of AD 2013-24-01. They stated that an alternative method of compliance (AMOC) exists that grants a relaxation of the requirements of

paragraphs (g) and (h) of AD 2013-24-01 as long as the aircraft engines have the required software versions.

We disagree. Although Transport Airplane Directorate issued aircraft level AD 2013-24-01 and granted an AMOC, those are interim actions. Complying with this AD is required to remove the unsafe condition and is terminating action to certain requirements of AD 2013-24-01. We did not change this AD.

Request to Revise a Definition

GE requested that we revise the definition of an engine shop visit. They suggested that we add "Workscopes involving only externals, including transfer gearbox (TGB) and accessory gearbox (AGB) do not constitute an engine shop visit for the purpose of this AD."

We disagree. The definition of a shop visit as "the induction of an engine into the shop for maintenance involving the separation of pairs of major mating engine case flanges" is a standard industry definition. Workscopes involving the TGB/AGB, or externals, do not separate major mating engine case flanges and do not constitute an engine shop visit for the purpose of this AD. We did not change this AD.

Request to Change Compliance Time

Cathay Pacific Airways Limited requested that we clarify which parts may be installed into the engine.

We disagree. The FAA does not intend to specify which parts may be installed into the engine, only those parts that may not be installed into the engine. Specifying which parts are eligible for installation may inadvertently prohibit new parts that are introduced from being installed into the engine. We did not change this AD.

Agreement with the Proposed AD

The Air Line Pilots Association expressed agreement with this AD.

Conclusion

We reviewed the relevant data, considered the comments received, and determined that air safety and the public interest require adopting this AD with the changes described previously. We determined that the changes we made as the result of the comments we received:

- Are consistent with the intent that was proposed in the NPRM for correcting the unsafe condition; and
- Do not add any additional burden upon the public than was already proposed in the NPRM.

We also determined that these changes will not increase the economic burden on any operator or increase the scope of this AD.

Related Service Information

We reviewed GE GEnx-2B Service Bulletin (SB) 72-0241 R00, dated March 16, 2016 that describes removal and installation procedures of fan hub stator assembly booster outlet guide vane; GE GEnx-2B SB 73-0041 R00, dated July 2, 2015 that describes reprogramming procedures for EEC FADEC software, version C075; and GE GEnx-1B SB 73-0044 R00, dated July 1, 2015 that describes reprograming procedures for EEC FADEC software, version B185.

Costs of Compliance

We estimate that this AD affects 130 engines installed on airplanes of U.S. registry. We estimate that it would take about 1 hour per engine to comply with the software installation required by this AD. We also estimate that 32 engines would require hardware replacement, which would take about 60 hours per engine. Required parts cost about $390,000 per engine. The average labor rate is $85 per hour. Based on these figures, we estimate the cost of this AD on U.S. operators to be $12,654,250.

Authority for this Rulemaking

Title 49 of the United States Code specifies the FAA's authority to issue rules on aviation safety. Subtitle I, Section 106, describes the authority of the FAA Administrator. Subtitle VII, Aviation Programs, describes in more detail the scope of the Agency's authority.

We are issuing this rulemaking under the authority described in Subtitle VII, Part A, Subpart III, Section 44701, "General requirements." Under that section, Congress charges the FAA with promoting safe flight of civil aircraft in air commerce by prescribing regulations for practices, methods, and procedures the Administrator finds necessary for safety in air commerce. This regulation is within the scope of that authority because it addresses an unsafe condition that is likely to exist or develop on products identified in this rulemaking action.

Regulatory Findings

We have determined that this AD will not have federalism implications under Executive Order 13132. This AD will not have a substantial direct effect on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government.

For the reasons discussed above, I certify that this AD:

(1) Is not a "significant regulatory action" under Executive Order 12866,

(2) Is not a "significant rule" under DOT Regulatory Policies and Procedures (44 FR 11034, February 26, 1979),

(3) Will not affect intrastate aviation in Alaska, and

(4) Will not have a significant economic impact, positive or negative, on a substantial number of small entities under the criteria of the Regulatory Flexibility Act.

List of Subjects in 14 CFR Part 39

Air transportation, Aircraft, Aviation safety, Incorporation by reference, Safety.

Adoption of the Amendment

Accordingly, under the authority delegated to me by the Administrator, the FAA amends 14 CFR part 39 as follows:

PART 39 - AIRWORTHINESS DIRECTIVES

1. The authority citation for part 39 continues to read as follows:

Authority: 49 U.S.C. 106(g), 40113, 44701.

§ 39.13 [Amended]

2. The FAA amends § 39.13 by removing Airworthiness Directive (AD) 2015-15-03, Amendment 39-18212 (80 FR 42707, July 20, 2015), and adding the following new AD:

2017-09-06: **General Electric Company:** Amendment 39-18868; Docket No. FAA-2015-0165; Directorate Identifier 2015-NE-02-AD.

(a) **Effective Date**

This AD is effective [INSERT DATE 35 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

(b) Affected ADs

This AD replaces AD 2015-15-03, Amendment 39-18212 (80 FR 42707, July 20, 2015). This AD also affects AD 2013-24-01, Amendment 39-17675 (78 FR 70851, November 27, 2013).

(c) Applicability

This AD applies to all General Electric Company (GE) GEnx-1B and GEnx-2B turbofan engines.

(d) Unsafe Condition

This AD was prompted by GE implementing final design changes that remove the unsafe condition. We are issuing this AD to prevent engine failure, loss of thrust control, and damage to the airplane.

(e) Compliance

Comply with this AD within the compliance times specified, unless already done.

(1) Thirty days after the effective date of this AD, do not operate any GE GEnx-1B engine with electronic engine control (EEC) full authority digital engine control (FADEC) software, version B180 or earlier, installed.

(2) Thirty days after the effective date of this AD, do not operate any GE GEnx-2B engine with EEC FADEC software, version C068 or earlier, installed.

(3) At the next shop visit after the effective date of this AD, remove from service all GE GEnx-2B67, -2B67B, and -2B67/P fan hub stator assembly booster outlet guide vanes, part number B1316-00720, and replace with a part eligible for installation.

(f) Installation Prohibition

After removing any software, version B180 or earlier, for the GE GEnx-1B engines; or software, version C068 or earlier, for the GE GEnx-2B engines, do not operate those engines with any software, version B180 or C068, or earlier.

(g) Definition

For the purpose of this AD, an "engine shop visit" is the induction of an engine into the shop for maintenance involving the separation of pairs of major mating engine case flanges, except for the following situations which do not constitute an engine shop visit:

(1) Separation of engine flanges solely for the purposes of transportation without subsequent maintenance does not constitute an engine shop visit.

(2) Separation of engine flanges solely for the purpose of replacing the fan or propulsor without subsequent maintenance does not constitute an engine shop visit.

(h) Terminating Action

Compliance with this AD, for all engines installed on a specific airplane, is a terminating action to AD 2013-24-01 for that specific airplane, since it removes the unsafe condition on that specific airplane.

(1) For GEnx-1B engines:

(i) Compliance with paragraphs (e)(1) and (f) of this AD, for all engines on an airplane, is an approved terminating action for that airplane for paragraphs (g) and (i) of AD 2013-24-01.

(ii) Note that paragraph (j) of AD 2013-24-01, which contains post-event inspection requirements, remains in force.

(2) For GEnx-2B engines:

(i) Compliance with paragraphs (e)(2), (e)(3), and (f) of this AD, for all engines on an airplane, is an approved terminating action for that airplane for paragraphs (g) and (h) of AD 2013-24-01.

(ii) Note that paragraph (j) of AD 2013-24-01, which contains post-event inspection requirements, remains in force.

(i) Alternative Methods of Compliance (AMOCs)

The Manager, Engine Certification Office, FAA, may approve AMOCs for this AD. Use the procedures found in 14 CFR 39.19 to make your request. You may email your request to: ANE-AD-AMOC@faa.gov.

(j) Related Information

(1) For more information about this AD, contact Christopher McGuire, Aerospace Engineer, Engine Certification Office, FAA, Engine & Propeller Directorate, 1200 District Avenue, Burlington, MA 01803; phone: 781-238-7120; fax: 781-238-7199; email: chris.mcguire@faa.gov.

(2) GE GEnx-2B Service Bulletin (SB) 72-0241 R00, dated March 16, 2016; GE GEnx-2B SB 73-0041 R00, dated July 2, 2015; and GE GEnx-1B SB 73-0044 R00, dated July 1, 2015 can be obtained from GE, using the contact information in paragraph (j)(3) of this AD.

(3) For service information identified in this AD, contact General Electric Company, GE Aviation, Room 285, 1 Neumann Way, Cincinnati, OH 45215; phone: 513-552-3272; email: geae.aoc@ge.com.

Issued in Burlington, Massachusetts, on April 27, 2017.

Robert J. Ganley,
Acting Manager, Engine & Propeller Directorate,
Aircraft Certification Service.
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